

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) An image pick-up apparatus for picking up a plurality of images being chronologically arranged along time-series to provide an image, comprising:

a means for obtaining information about changes in gray level value between said plurality of images; and

a means for determining a timing for selecting at least one suitable picked-up image of said plurality of picked up images,

wherein said selection is based on a result from said obtained information and wherein said selected at least one suitable picked-up image is output to at least one of a display and a fingerprint recognition module.

2. (Previously Presented) The image pick-up apparatus according to Claim 1, wherein said means for obtaining information compares said gray level value of pixels in an image of said plurality of images with similarly positioned pixels in another image of said plurality of images, and obtains a number of pixels whose said gray-level value has increased and a number of pixels whose said gray-level value has decreased.

3. (Currently Amended) ~~The image pick-up apparatus according to Claim 2,~~ An image pick-up apparatus for picking up a plurality of images being chronologically arranged along time-series to provide an image, comprising:

a means for obtaining information about changes in gray level value between said plurality of images; and

a means for determining a timing for selecting at least one of said plurality of picked up images,

wherein said selection is based on a result from said obtained information,

wherein said means for obtaining information compares said gray level value of pixels in an image of said plurality of images with similarly positioned pixels in another image of said plurality of images, and obtains a number of pixels whose said gray-level value has increased and a number of pixels whose said gray-level value has decreased, and

wherein said means for determining a timing determines a timing for extracting one image from said plurality of images, when said number of pixels with increase in said gray-level value is less than the number of pixels with decrease in said gray level value.

4. (Currently Amended) ~~The image pick-up apparatus according to Claim 2,~~ An image pick-up apparatus for picking up a plurality of images being chronologically arranged along time-series to provide an image, comprising:

a means for obtaining information about changes in gray level value between said plurality of images; and

a means for determining a timing for selecting at least one of said plurality of picked up images,

wherein said selection is based on a result from said obtained information,

wherein said means for obtaining information compares said gray level value of pixels in an image of said plurality of images with similarly positioned pixels in another image of said plurality of images, and obtains a number of pixels whose said gray-level value has increased and a number of pixels whose said gray-level value has decreased, and

wherein said means for determining a timing ~~determines~~ ~~determines~~ ~~a timing~~ for extracting one image from said plurality of images when a predetermined threshold value of pixel numbers is greater than an absolute value of a difference between said number of pixels with increase in said gray-level value and the number of pixels with decrease in said gray-level value.

5. (Previously Presented) The image pick-up apparatus according to Claim 3, wherein, said image information obtaining means for each image in said plurality of images obtains a number of pixels whose said gray-level value exceeds a predetermined gray-level threshold value; and

said timing determining means determines said timing for extracting said one image, when said number of pixels of the one image with said gray-level value above the gray-level threshold value exceeds a predetermined pixel number threshold.

6. (Currently Amended) ~~The image pick-up apparatus according to Claim 2,~~ An image pick-up apparatus for picking up a plurality of images being chronologically arranged along time-series to provide an image, comprising:

a means for obtaining information about changes in gray level value between said plurality of images; and

a means for determining a timing for selecting at least one of said plurality of picked up images,

wherein said selection is based on a result from said obtained information,

wherein said means for obtaining information compares said gray level value of pixels in an image of said plurality of images with similarly positioned pixels in another image of said plurality of images, and obtains a number of pixels whose said gray-level value has increased and a number of pixels whose said gray-level value has decreased,

wherein said image information obtaining means for each image in said plurality of ~~images~~ images obtains a number of pixels with said gray-level value exceeding a predetermined gray level threshold value $\frac{1}{2}$, and

wherein said timing determining means determines said timing for extracting one image from said plurality of images, when said number of pixels with said gray-level value exceeding said predetermined gray level threshold value outnumbers a predetermined pixel numbers threshold, and further when an absolute value of a difference between said number of pixels with increase in said gray-level value and the number of pixels with decrease in said gray-level value is less than a second predetermined pixel number threshold.

7. (Previously Presented) The image pick-up apparatus according to Claim 2, wherein said plurality of images comprises at least two successive images which had been successively picked up by said image pick-up apparatus.

8. (Previously Presented) The image pick-up apparatus according to Claim 7, wherein a first image from said at least two successive images is a first frame and a second image from said at least two images is a second frame.

9. (Currently Amended) ~~The image pick-up apparatus according to Claim 8,~~ An image pick-up apparatus for picking up a plurality of images being chronologically arranged along time-series to provide an image, comprising:

a means for obtaining information about changes in gray level value between said plurality of images; and

a means for determining a timing for selecting at least one of said plurality of picked up images,

wherein said selection is based on a result from said obtained information,

wherein said means for obtaining information compares said gray level value of pixels in an image of said plurality of images with similarly positioned pixels in another image of said plurality of images, and obtains a number of pixels whose said gray-level value has increased and a number of pixels whose said gray-level value has decreased,

wherein said plurality of images comprises at least two successive images which had been successively picked up by said image pick-up apparatus,

wherein a first image from said at least two successive images is a first frame and a second image from said at least two images is a second frame, and

wherein said apparatus further comprises:

an image picking up means for picking up images;

a memory means for storing said images; comprising first memory means and second memory means for said plurality of images, and

a data processing means comprising: a pixel comparing means, a pixel number counting means for counting a number of said pixels whose gray level value has changed, and said timing determining means, and

an output means.

10. (Previously Presented) The image pick-up apparatus according to Claim 9, wherein said first frame is stored in said first memory means and said second frame picked up immediately after said first frame is stored in said second memory means.

11. (Previously Presented) The image pick-up apparatus according to Claim 9, wherein said pixel comparing means compares a gray level value of each pixel in said first frame with a gray level value of each pixel in said second frame pixel corresponding to said each pixel in said first frame.

12. (Previously Presented) The image pick-up apparatus according to Claim 1, wherein said image processing comprises a fingerprint image data processing.

13. (Currently Amended) The image pick-up method for picking up a plurality of images being chronologically arranged along time-series to provide an image, comprising:

obtaining information about changes in gray level value between said plurality of images;
and

deciding a timing at which at least one suitable picked-up image of said plurality of picked up images is selected,

wherein said selection is based upon on a result from said obtained information and
wherein said selected at least one suitable picked-up image is output to at least one of a display
and a fingerprint recognition module.

14. (Previously Presented) The image pick-up method according to Claim 13, wherein obtaining said information further comprises:

comparing said gray level value of pixels in one image from said plurality of images with similarly positioned pixels of another from said plurality of images, and

obtaining a number of pixels in said one image whose said gray-level value has increased and a number of pixels in said one image whose said gray-level value has decreased.

15. (Currently Amended) ~~The image pick-up method according to Claim 14,~~ An image pick-up method for picking up a plurality of images being chronologically arranged along time-series to provide an image, comprising:

obtaining information about changes in gray level value between said plurality of images;
and

deciding a timing at which at least one of said plurality of picked up images is selected,
wherein said selection is based upon on a result from said obtained information,
wherein obtaining said information further comprises:

comparing said gray level value of pixels in one image from said plurality of
images with similarly positioned pixels of another from said plurality of images, and

obtaining a number of pixels in said one image whose said gray-level value has
increased and a number of pixels in said one image whose said gray-level value has
decreased, and

wherein ~~determining~~ determining a timing for extracting at least one image from said
plurality of images is based on, when said number of pixels with increase in said gray-level
value is less than the number of pixels with decrease in said gray-level value.

16. (Currently Amended) ~~The image pick-up method according to Claim 14,~~ An image pick-up method for picking up a plurality of images being chronologically arranged along time-series to provide an image, comprising:

obtaining information about changes in gray level value between said plurality of images;
and
deciding a timing at which at least one of said plurality of picked up images is selected,
wherein said selection is based upon on a result from said obtained information,
wherein obtaining said information further comprises:
comparing said gray level value of pixels in one image from said plurality of
images with similarly positioned pixels of another from said plurality of images, and
obtaining a number of pixels in said one image whose said gray-level value has
increased and a number of pixels in said one image whose said gray-level value has
decreased, and
wherein determining a timing for extracting an image, is based on a predetermined
threshold value of pixel numbers being greater than an absolute value of a difference between
said number of pixels with increase in said gray-level value and the number of pixels with
decrease in said gray-level value-.

17. (Currently Amended) ~~The image pick-up method according to Claim 13,~~ An image
pick-up method for picking up a plurality of images being chronologically arranged along time-
series to provide an image, comprising:

obtaining information about changes in gray level value between said plurality of images;
and
deciding a timing at which at least one of said plurality of picked up images is selected,

wherein said selection is based upon on a result from said obtained information, and

wherein:

said step of obtaining said information obtains a number of pixels of an ~~image~~
image of said plurality of images having said gray-level value exceeding a predetermined
gray level threshold value; and

said step of deciding a timing for extracting one image decides a timing where
said number of pixels with said gray-level value exceeding said predetermined gray level
threshold value outnumber a predetermined threshold value of pixel numbers, and
further where said number of pixels with increase in said gray-level value is less than the
number of pixels with decrease in said gray-level value.

18. (Currently Amended) ~~The image pick-up method according to Claim 13, An image~~
pick-up method for picking up a plurality of images being chronologically arranged along time-
series to provide an image, comprising:

obtaining information about changes in gray level value between said plurality of images;

and

deciding a timing at which at least one of said plurality of picked up images is selected,

wherein said selection is based upon on a result from said obtained information, and

wherein:

said step of obtaining information obtains a number of pixels in an image from said plurality of images, with said gray-level value exceeding a predetermined gray level threshold value; and

said step of determining a timing determines said timing when said number of pixels with said gray-level value exceeding a predetermined gray level threshold value outnumbers a predetermined threshold value of pixel numbers, and further when an absolute value of a difference between said number of pixels with increase in said gray-level value and the number of pixels with decrease in said gray-level value is less than a second predetermined pixel number threshold.

19. (Previously Presented) The image pick-up method according to Claim 13, wherein said plurality of images comprises at least two successive images which had been successively picked up by said image pick-up method.

20. (Original) The image pick-up method according to Claim 13, wherein a first image from said at least two successive images comprises a first frame and a second image from said at least two successive images comprises a second frame.

21. (Currently Amended) ~~The image pick-up method according to Claim 13,~~ An image pick-up method for picking up a plurality of images being chronologically arranged along time-series to provide an image, comprising:

obtaining information about changes in gray level value between said plurality of images;
and
deciding a timing at which at least one of said plurality of picked up images is selected,
wherein said selection is based upon on a result from said obtained information, and
wherein said method further comprises:
 picking up said plurality of images with an image picking up means;
 storing said images by storing said first frame image data from said at least two
 successive images into a first memory means and storing said second frame image data
 from said at least two successive images into a second memory means;
 comparing and counting number of pixels with a change in gray level value by
 using data processing means; and
 ~~determining~~ determining a timing to extract at least one suitable image for image
 processing, and
 outputting said at least one suitable image.

22. (Previously Presented) The image pick-up method according to Claim 13, wherein
said method further comprises: comparing said gray level value of each one of said pixels of
said first frame with a gray level value of each one similarly positioned pixels of said second
frame.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/740,954

23. (Previously Presented) The image pick-up method according to Claim 13, wherein said image processing comprises a fingerprint image data processing.